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ABSTRACT

This literature review examines the effectiveness of student financial aid in light of doubts raised about it at the start of the 1980s and subsequent cuts in federal support for student aid as a result of those doubts. The review has three objectives: to determine whether there are reasons to doubt the effectiveness of student aid; to determine whether changes in federal aid policy during the 1980s influenced equal opportunity; and to identify unanswered research questions. The review indicates that student aid is an effective mechanism for promoting equal educational opportunity. However, the erosion in federal grant dollars during the past 15 years may have influenced an erosion in minority access. Based on this review, research questions are identified that merit consideration by institutional and policy researchers. Contains 53 references. (Author/GLR)

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THE IMPACT OF STUDENT FINANCIAL AID:

A REVIEW OF RECENT RESEARCH

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THE IMPACT OF STUDENT FINANCIAL AID:
A REVIEW OF RECENT RESEARCH

Abstract

At the start of the past decade, serious doubts were raised about the effectiveness of student financial aid, which influenced cuts in federal support for student aid in the 1980s. Since lingering doubts about the effectiveness of student aid could impair further federal funding for student aid programs, it is important to review recent research in order to determine whether these doubts are reasonable. This review has three objectives: to determine whether there are reasons for doubts about the effectiveness of student aid; to determine whether changes in federal aid policy during the 1980s influenced equal opportunity; and to identify unanswered research questions. The review indicates that student aid is an effective mechanism for promoting equal educational opportunity. However, the erosion in federal grant dollars during the past fifteen years may have influenced an erosion in minority access. Based on this review, research questions are identified that merit consideration by institutional and policy researchers.

THE IMPACT OF STUDENT FINANCIAL AID: A REVIEW OF RECENT RESEARCH

The intent of federal student financial aid programs authorized under Title IV of the Higher Education Act (HEA) is to promote equal educational opportunity. Doubts about the effectiveness of student aid in promoting this goal were raised by researchers in the early 1980s. In particular, Hansen's conclusion that federal student aid functioned as an income transfer program (e.g. Hansen, 1983) was particularly detrimental to political interests that support a larger investment in federal student aid programs. While it may be too late to recapture the cuts in federal grant programs that eventuated in the 1980s, given the current emphasis on reducing the federal budget deficit, it is, nevertheless, an opportune time to reconsider doubts about the effectiveness of student aid. This paper reviews prior research on the impact of student financial aid. First, the framework used for the review is discussed briefly. Second, prior research is reviewed focusing on what we know about the impact of student aid on equal opportunity, considering research on each of the components of equal opportunity: access (attendance), choice of school, persistence, choice of major, and earnings. Finally, the findings from recent research are summarized and research questions that merit further consideration by policy and institutional researchers are identified.

FRAMEWORK FOR THE REVIEW

There have been a few recent, reasonably comprehensive reviews of the research literature on the impact of student aid (e.g. Jensen, 1983; Leslie and Brinkman, 1988; St. John, Byce, and Norris, 1987). Unfortunately, most of the research literature examined in these reviews was conducted on students who entered college in the early 1970s or before. Thus, we know very little from prior reviews about the impact of changes in federal student aid policy during the 1980s. Fortunately a small number of recent studies have considered the influence of student aid in the 1980s, which can be used for comparison with prior periods.

According to Leslie and Brinkman (1988) there are three possible ways to study the impact of student financial aid: opinion surveys, or studies that ask students about whether student aid influenced their choices; trend studies, which examine the association between funding levels for federal programs and college enrollments; and econometric studies, which examine the influence of aid on actual choices made by students, controlling for other factors that influence their choices. The focus of this review is on the third category of research.

There is a sequence of student choices that could logically be influenced by student aid: decisions to attend college, choices about which college to attend, decisions to persist, and choices about majors The factors that need to be controlled for in order to assess the impact of student aid on these outcomes

are illustrated in table 1.[1] Research on each of these outcomes would need to control for student background (social economic status in high school, student ability/achievement, and high school experiences). Additional factors that should be considered in research on particular student outcomes are also identified.

First, access (or the opportunity to attend college) has long been considered the cornerstone of the equal educational opportunity goal. In addition to considering social background, research on the decision to attend should also control for the influence of student aspirations, whether to apply to a college, and the financial aid offer made by the college.[2] Access studies were selected for this review that controlled for these factors.

Second, choice of school has also long been considered the second objective related to equal educational opportunity in higher education. Research on student choice of college needs to control for social background factors, educational aspirations, the characteristics of colleges students applied to, the costs of institutions students applied to, and the aid offered by the colleges students applied to.[3] This paper reviews the few studies that have controlled for these factors.

Persistence is the third objective that has long been considered a component of the equal educational opportunity goal. To examine the influence of student aid on persistence it is necessary to control for the impact of students' backgrounds, their aspirations, the characteristics of the colleges they

attend, and their college experiences[4], as well as student aid.[5] This paper examines national studies that control for these types of variables.

Fourth, in theory, student aid, especially debt burden or loan forgiveness, can influence student major choice. In the middle 1980s, several authors questioned whether growing levels of debt were influencing students' academic choices (e.g Newman, 1985; Kramer and Van Dusen, 1986). If debt did in fact influence students to choose majors, then this would be considered an unintended, probably negative, influence on equal opportunity. Alternately, if loan forgiveness influences choice of major, this could be considered a positive influence (Arfin, 1986; Spero, 1986). Logically, research that considers the influence of student aid on major choice needs to consider social background, educational aspirations, college characteristics, college experience, original choice of major, occupational aspirations and potential earnings, along with the influence of debt, the financial aid variable that might logically influence major choice.[6] There have only been a few studies that have examined the influence of debt on major choice.

Fifth, student aid can also have an influence on educational attainment and earnings. Research on the influence of educational attainment on earnings is relevant to student aid policy simply because student aid influences both access and persistence -- the two components of postsecondary attainment. Research that considers the influence of education on earnings

also needs to consider the influence of social background and perhaps aspirations (educational and occupational).[7] Recent research on this topic is considered in the review.

This review of recent research focuses on three issues. First, is student aid effective in promoting equal opportunity? This question is important because doubts have been raised about the effectiveness of student aid (e.g. Hansen, 1983). Second, how has the impact of student aid changed in the 1980s compared to the 1970s and prior decades? This question is important because there were major changes in student aid policy during the 1980s, including a shift in emphasis from grants to loans, that could have an influence on equal opportunity. Third, what types of further research are needed to inform institutional and government policy on student financial aid?

RESEARCH REVIEW

Access

From prior literature reviews it is clear that the econometric studies that control for appropriate background factors consistently find that student aid has a positive influence on student decisions to attend college (Jensen, 1983; Leslie and Brinkman, 1988; St. John, Byce, and Norris, 1988). The early student demand studies, mostly conducted before the federal role in student aid developed, consistently found that students were price responsive to tuition increases, that the probability that students would enroll decreased with increases in the amount of tuition institutions charge (Jackson and

Weathersby, 1975; Leslie and Brinkman, 1988; McPherson, 1978). The early demand studies were severely criticized, among other reasons, because they did not have sufficient controls (e.g. Dresch, 1975), and therefore only have limited usefulness for public policy. However, the initial studies using the National Longitudinal Study of the High School Class of 1972 (NLS-72) (e.g. Jackson, 1978; Manski and Wise, 1983), which usually had appropriate controls, consistently found that student aid had a positive impact on attendance (Leslie and Brinkman, 1988; St. John, Byce, and Norris, 1988).

There have been a few recent studies, not considered in prior reviews, that compared the influence student aid had on student attendance[8] decisions in the 1970s and 1980s. Jackson (1989) used NLS-72 and the High School and Beyond Senior Cohort (HSB-80) to compare the influence aid offers had on student attendance decisions during the early 1970s and early 1980s. He found that student aid had a positive influence on enrollment by college applicants in 1972 and 1980 and that the relative impact of aid, the amount of variance explained by student aid, was similar in the two periods. St. John and Noell (1989) compared the influence different types of student aid packages had on the enrollment decisions of students in the high school classes of 1972, 1980 and 1982, using NLS-72, HSB-80, and the High School and Beyond Sophomore Cohort (HSB-82). They found that: 1) all types of aid packages were positively associated with attendance decisions when all students were considered; and 2) that packages

with loans were less consistently significant for minority applicants than for white applicants in the 1980s.

Two price-response studies merit mention is this review. Schwartz (1985) used HSB-80 to examine the influence of grant amounts and loan subsidies on decisions to attend public universities and found that students were responsive to the amount of grants they there likely to receive, but not to the subsidies to the loan amounts they were eligible for. St. John (1990a) used HSB-82 to examine price response to tuition and student aid in enrollment decisions by college applicants in the high school class of 1982. He found that: 1) applicants were more responsive to student aid -- all types -- than to tuition; 2) that low-income applicants were highly price responsive to grants, but not to loans; and 3) that middle-income applicants were more price responsive to grants than to loans.[9]

In another recent study using HSB-82, St. John (in press) concluded that three factors are likely to increase minority attendance: Academic preparation (as measured by test scores and grades), postsecondary aspirations, and student aid. He then identified three types of actions that could improve minority student participation rates: 1) early intervention programs for at-risk students, such as accelerated schools for at-risk students (e.g. Levin, 1988); 2) public information programs aimed at middle-income students (e.g. Stage and Hossler, 1989); and 3) increases in student aid, especially grants. Increases in grants is the one type of action that can have an immediate influence,

while the other strategies take more time. In the long term, a comprehensive strategy emphasizing all three methods would seem to be most effective.

In combination this research helps explain Hansen's finding that student aid was not effective. Hansen (1983) used Current Population Surveys (CPS) to examine college participation rates by different subpopulations in the traditional college-age cohort (eighteen-to-twenty-four-year olds) in 1972, the year before the Pell program was implemented, and in 1978, the year the Middle Income Student Assistant Act (MISAA) was implemented. He found that the participation rates by upper-middle- and upper-income students increased more during the six-year period than enrollment rates by lower-middle-and low-income students and, based on this finding, concluded that aid was not effective. However, the target population for student aid shifted in the middle 1970s -- the percentage of middle income students receiving federal grants and loans increased substantially (St. John and Byce, 1982) -- and therefore increases in participation rates by middle- as well as lower-income students could be attributed to aid. The research reviewed above indicates that the responsiveness to aid offers was similar in both periods (e.g. Jackson, 1989). Further, the income cap for guaranteed student loans was removed in the fall of 1978, as a result of MISAA. Thus, the finding that lower-middle- and upper-middle-income students were price responsive to loans (e.g. St. John, 1990a) also indicates that the growth in gains in participation rates by

those with higher-than-average incomes could be at least partially attributed to shifts in student aid policy, especially the increased emphasis on loans. Therefore, the fact that upper-income enrollment rates increased faster than lower-income enrollment rates (Hansen's finding) would not imply financial aid is ineffective.

Choice of School

The reviews of prior research on student choice of school consistently conclude that student aid is effective in promoting student choice of school (Jensen, 1983; Leslie and Brinkman, 1988; St. John, Byce, and Norris, 1988). Two prior studies are particularly notable. Jackson (1977), in an analysis of NLS-72, concluded that the amount of student aid offered had a significant influence on the choice among the schools students applied to. Tierney (1982a&b) used the Cooperative Institutional Research Program (CIRP) data to examine the influence of student aid and tuition charges on choices between public and private institutions by students who applied to both. He concluded that both the amount of aid offered -- all types -- and the amount of tuition charged influenced student choices.

Another more recent study also merits mention. Grubb (1990) used NLS-72 to examine the causes of enrollment in different types of institutions. He concluded that: 1) higher tuition charges in community colleges tended to drive more individuals, especially women, into private schools; and 2) higher tuition charges in public four-year colleges tended to increase

enrollment of both men and women in private research universities and to increase men's enrollment at Liberal Arts I Colleges. Unfortunately, there is no more recent research on school choices made by students in the 1980s, although other research on student access also merits reconsideration.

During the 1980s, enrollments in private colleges and universities were consistently higher than predicted by the National Center for Education Statistics (NCES), in spite of the fact that tuition charges by private institutions rose faster than inflation and faster than public sector tuition charges (St. John, Norris, and Byce, 1988). The prior analyses of student choice, by themselves, do not explain why enrollments would be higher than expected in private institutions. However, this development seems a little more reasonable if we also consider the facts that: 1) students were more responsive to student aid than to tuition charges in their attendance decisions (St. John, 1990a); and 2) middle-income students were more responsive to loans than to other forms of student aid or tuition (St. John, 1990a). The increased emphasis on federal loans during the 1980s, coupled with the fact that more private institutions engaged in enrollment management processes that involved reallocating some tuition revenues to student aid during this period (Hossler, 1984, 1986; St. John, Norris, and Byce, 1988), helps explain why private institutions were able to maintain higher enrollment levels than projected.

Clearly more research is needed on factors related to choice of school. At the state and federal levels, there is a need for research on how shifts in student aid policy influence student choice of school. If the federal government's cuts in student aid persist into the 1990s, then more institutional research on student choice of school is desirable, especially research that examines how institutional grants and tuition charges influence student enrollment. Increases in the number of schools that conduct and publish such research can increase the level of knowledge about how students choose schools.

Persistence

Until recently most persistence research was conducted by institutions and relatively little was conducted at the national level. There is disagreement, however, about whether institutional research on the impact of student aid concludes that student aid has an influence on persistence. Tinto (1990), for example, based on his review of sociological research on year-to-year persistence, concluded that student aid had little influence on persistence, while Leslie and Brinkman (1988), in their review of all persistence research, concluded that student aid does have a positive influence on persistence. There are institutional studies of persistence using Tinto's model that conclude financial aid has no influence on persistence (e.g. Moline, 1988), as well as studies using Tinto's model that conclude financial aid has had a positive influence on persistence (e.g. Voorhees, 1985). Certainly more investigation

is needed on: 1) whether student aid, when measured at the institutional level, has an influence on persistence; and 2) under what conditions student aid has an influence.

One possible explanation for the discrepancies in findings from institutional studies is that students in the same institutions are subject to the same tuition charges and the same aid packaging philosophies; therefore there might not be sufficient variation for aid awards to be statistically significant when the influence of student aid is examined at the institutional level. Another possibility is that there are differences in logical and statistical models used at the institutional levels that result in discrepancies in the effects of student aid when institutional studies are compared. However, these ambiguities about whether aid is effective in promoting persistence at the institutional level does not mean that student aid cannot have an influence on persistence when measured at the national level.

Most national studies of student persistence find that financial aid has a positive influence (Astin, 1975; Carroll, 1987; Terkla, 1985; St. John, 1989 & 1990b; St. John and Kirshstein, 1987, in press). However there are some differences in the impact of different types of student aid at different points in time. Astin (1975), who used CIRP data to follow the college freshman class of 1968, found a negative association between the receipt of loans and persistence during the first two years of college and a positive association between loans and

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four-year persistence. He concluded that loans have a negative influence on persistence and that the positive association with long-term persistence was an artifact attributable to the fact that students who persist were more likely to receive loans. Astin found that most other forms of student aid had a positive association with persistence. However, his conclusions about the effectiveness of loans have raised doubts that have persisted until recently.

There were two subsequent studies of persistence using NLS-72 that added to our knowledge about the influence of student aid, but did not clarify our understanding of how loans influenced persistence. Peng and Fetters (1978), who found that loans had no significant influence on persistence during the first two years in college, questioned Astin's conclusions about loans. Terkla (1985) found a positive association between the receipt of student aid and long-term persistence to degree completion, but she did not examine the influence of different types of student aid. Therefore neither research resolved the issue of whether loans had a positive or negative association with persistence.

To examine the influence of different types of aid packages on persistence, St. John, Kirshstein, and Noell (1987, in press) developed a new logical model for examining year-to-year persistence using national data. The year-to-year approach to examining persistence made it possible to control for the artifact issue identified by Astin; that is, by examining the

types of packages students received each year it was possible to control for the fact that students who persist are more likely to take out loans. They concluded that all forms of aid were positively associated with year-to-year persistence by students in the 1980s (using HSB-80).

In a subsequent study, St. John (1989) compared the influence of different types of student aid packages on year-to-year persistence by college students who graduated from high school in 1972, 1980, and 1982, using NLS-72, HSB-80 and HSB-82. He found that: 1) loans as the only form of aid had a negative association with first-to-second-year persistence for the 1972 cohort, but a positive association with transition for students in the 1980s; 2) loans as the only form of aid were negatively associated with fourth-to-fifth year persistence for students in the 1980 cohort; and 3) with these exceptions, all forms of student aid were consistently and positively associated with year-to-year persistence for all three cohorts. From these findings St. John concluded that attitudes toward loans held by college freshman had apparently changed between the early 1970s and the early 1980s.[10] The explanation that freshmen in prior decades did have a negative attitude toward loans would help explain why Astin found that loans had a negative association with persistence during the first two years in college but not with long-term persistence.

In another recent study, St. John (1990b) examined student price responsiveness in year-to-year persistence decisions.[11] He

found that students were more price responsive to student aid -- all forms -- than to tuition. He concluded that institutions need to consider student aid when they increase tuition charges each year because students were so price responsive to student aid. However, he suggested that caution be used when using price-response measures for loans, since his earlier study found that enrollment decisions by low-income students were responsive to grants but not to loans (i.e. St. John, 1990a).

One further study merits consideration. Carroll (1987) examined the influence of different types of aid on within-year persistence by students in the high school class of 1980 (using HSB-80) and concluded that grants and not loans were positively associated with persistence. His conclusion casts new doubts on the effectiveness of loans. Future researchers may want to compare the influence of student aid on within-year and year-to-year persistence for the same cohort of students to help explain why there are still discrepancies about the influence of loans on persistence.

Choice of Major

Student choice of major is becoming a topic of increasing interest in higher education. Choice of major is important to public and institutional policy on student aid for two possible reasons: 1) growing levels of debt could have an influence on student choice of major (Kramer and Van Dusen, 1986; Newman, 1985) and 2) states may want to use loan forgiveness or other forms of aid to encourage students to select majors in certain

high need areas (Arfin, 1986; Spero, 1986). This is an area in which research has been quite limited.

One recent study (St. John and Noell, 1987; St. John, Celebuski, Curtis, and Noell, 1987) examined the influence debt burden had on student decisions to change to majors with higher or lower expected earnings using HSB-80. This research had several interesting findings about major choice, including: 1) family income, college grades, and attending public colleges are positively associated with changing to majors with higher expected earnings; 2) mother's education and attending private colleges were negatively associated with changing to majors with higher expected earnings; and 3) blacks were more likely to change to majors with higher expected returns when students with any postsecondary education were considered, but were not significantly different when college persisters were considered, suggesting that some blacks with high expectations may drop out of college. However, debt burden did not have a significant influence on major choice.

This preliminary research suggests that debt burden has not yet reached the level where it has an influence on student choice of major. However, this topic merits monitoring in future national and institutional research.

Returns to Education

In their review of prior research, Leslie and Brinkman (1988) concluded that educational attainment does have a substantial influence on earnings. They concluded that the

monetary returns of private investment in education are substantial and merit continued investment. However, few studies have examined returns to education in the 1980s. Three recent studies merit some additional consideration.

First, in a study of the factors that influence earnings, using NLS-72, St. John and Masten (1988) found that in 1985 there were substantial individual earnings differentials attributable to postsecondary attainment. When other factors were controlled for: 1) those in the high school class of 1972 with some college earned $1,307 per year more than high school graduates with similar background; 2) those with four-year degrees earned $4,770 more than high school graduates; and 3) those with graduate degrees earned $7,566 more than high school graduates. And that the earnings differentials were consistently greater for women than for men.

Second, Pascarella and Smart (1990) examined the influence of college grades and educational attainment on early career earnings (1980 earnings) by a CIRP sample of students who entered college in 1971. They found that each grade point had had a direct effect of $432 in annual income for black women, $230 for white women, $59 for black men, and $86 for white men. In addition, they found that educational attainment had a positive influence on early career earnings for black and white women, but not for men. In combination, these first two studies indicate that the returns to education are now higher for women than for men.

In another recent study, St. John and Masten (1990) estimated the tax revenue returns attributable to the federal student aid programs. First, they estimated the gains in postsecondary attainment that were attributable to student aid using NLS-72; then used U.S. Census estimates of lifetime earnings and current tax law to estimate the tax revenue returns attributable to these gains. Under reasonable future economic assumptions, the net present value of the tax revenue returns to the federal government were estimated to be $4.30 for each student aid dollar spent on the high school class of 1972. Thus, from a federal policy perspective, the returns on the federal investment in student aid are high. And modest reductions in current funding for student aid could substantially reduce future tax revenues.

FINDINGS

Is Student Aid Effective In Promoting Equal Opportunity?

The preponderance of evidence from econometric studies supports the conclusion that student financial aid is an effective means of promoting equal opportunity. Virtually all studies of the influence of student aid on the attendance decisions of college applicants conclude that aid increases the probability that applicants will attend. Additionally price-response research on college applicants in the 1980s reveals that college applicants were more price responsive to the amount of student aid offered than to the amount of tuition charged. However, given the fact that low-income students were price responsive to grants, but not

to loans, it appears that not all forms of aid were equally effective in promoting access for the historically disadvantaged.

Student aid is also effective in promoting persistence in higher education. While institutional research on the impact of student aid has ambiguous results -- some studies conclude that aid is effective, others conclude that it has no significance -- national studies consistently find that student aid has a positive influence on persistence. Further, this research demonstrates that loans, in addition to grants and work, are effective in promoting persistence. However, it is possible that large levels of debt could have a detrimental influence on persistence to degree completion and, therefore, the impact of growing emphasis on loans merits scrutiny.

Further, there is no evidence to date that the levels of student debt have an influence on choices students make about their academic majors. However, this remains a possibility and, therefore, the influence of debt on major choice should be routinely monitored.

How Has the Impact of Student Aid Changed in the 1980s?

During the 1980s there were major changes in federal student aid policy, including an increased emphasis on loans and cutbacks in the constant-dollar value of grants. The influence this shift in policy had on equal opportunity was subtle, but nonetheless present. All types of packages were positively associated with attendance by applicants in the 1980s. Financial aid offers with grants and loans were effective in promoting access for

minorities, as well as whites, in the 1980s, as was the case in prior decades.

However, decreases in the amount of federal grant dollars available apparently did influence minority participation rates. Low-income students are price responsive to grants but not to loans, while middle-income students are more price responsive to loans than to grants. Given the decline in constant federal grant dollars between 1976 and 1984 (Lewis, 1989), it is little wonder that minority student participant rates also declined during this period (Mingle, 1987; Pelavin and Kane, 1988; St. John, and Noell, 1989). Further, the growth in loans may help explain why total enrollments remained higher than projected in the 1980s, in spite of the decline in minority participation rates. Apparently the increased availability of loans helped promote access for the middle income as well as for independent, returning students.

There were changes in the influence of loans on persistence during the 1980s compared to prior decades. The negative association between loans and persistence during the first few years of college, evident in prior decades, disappeared in the 1980s. However, loans as the only form of aid were negatively associated with fourth-to-fifth-year persistence (or persistence to degree completion) in the 1980s, but not in the 1970s. Thus debt burden could be problematic for long-term persistence, especially for students who do not receive other forms of aid.

Therefore, the influence of debt on persistence merits more scrutiny in the future.

What Type of Research are Needed to Inform Institutional and Government Policy? First, ongoing national research is needed on the impact of different types of aid on access to monitor the impact of policy changes on equal opportunity. Different forms of aid have different influences on different populations. For example, grants have a positive influence on access for low-income students, while loans are neutral. In the 1980s there was an increased emphasis on loans. There were also high default rates, especially in institutions that serve predominantly low-income and minority populations. Now, in the 1990s, there is a move to eliminate institutions with high default rates from the Stafford loan program. Given the fact that student background appears to have a larger influence on defaults than institutional loan management practices (Wilms, Moore, and Bolus, 1987), one is left to wonder whether efforts to restrict institutional eligibility for the Stafford program will further reduce minority participation. Certainly the impact of these new strategies needs to be closely monitored. The influence of growing levels of debt should also be routinely monitored, for reasons discussed.

Even more importantly there is a need for better information on how scarce federal aid dollars can best be targeted to promote equal opportunity. There is a need for more simulations that consider the impact of different financing strategies on

enrollment by low-income students. Given the fact that student aid is a highly profitable area of public investment (St. John and Masten, 1988), caution should be used whenever budget reduction strategies are considered to be sure that the selected strategies do not seriously impair access or persistence by low-income populations.

Second, there are also a number of federal policy issues that merit more basic research. The two issues that stand out are: 1) How did different forms of student aid influence student choice in the 1980s? and 2) Why are loans effective in studies of year-to-year persistence, but not of within-year persistence? Research on these questions can inform institutional packaging philosophies, as well as federal program revisions.

Third, given the fact that federal support for student financial aid is likely to erode further during the next decade, institutions need to develop a capacity to investigate the impact different types of student aid have on enrollment and persistence in their own institutions, so they can refine their financing and enrollment management strategies. Viable models are needed for institutional research on the impact of student aid. In particular, institutional research that considers price response in enrollment and persistence decisions is needed. Viable models for investigating the impact of student aid can be developed from extant data sources in most institutions -- records stored in admissions, financial aid, and student record systems. The financial aid administrators may need to be a critical part of

institutional research teams investigating the impact of student aid because they have the program expertise necessary for this type of inquiry. Institutional research on retention may also help resolve ambiguities about whether aid actually promotes persistence.

Finally, there is a need to begin the development of models that examine the influence of student aid on graduate student access and persistence. There has been relatively little research on graduate students and virtually no research on graduate student persistence. Yet graduate student persistence is important from a public policy perspective, because there are high returns to graduate education (St. John and Masten, 1988, 1990). Further, given the fact that loans are the main source of federal aid available for graduate study, we are left to wonder if more diversified approaches, including more grants, might not encourage graduate attainment by historically disadvantaged. For institutions, the issues of graduate student access and persistence are also important since it costs more to educate graduate students.

In conclusion, research on the impact of student aid has made substantial progress during the past two decades. We have reached the point where it is possible to cast off lingering doubts about the effectiveness of student aid. It is not only evident that student aid is effective in promoting equal opportunity, but that shifts in aid policy also influence student outcomes. The challenge remains to make better use of research

in the formulation of public and institutional policies on student aid.

Exhibit 1

A Dynamic Framework for Assessing the Effects of Student Aid on Equal Opportunity

Factors	Background	Sequence of Student Choices				First Job
		Access/ Attendance	Choice of College	Persistence	Choice of Major	
Old Factors	N.A.	1-3	1-4	1-4	1-4,12,13	1-4,13
New Factors	1. Socio-economic Background	4. Educational Aspirations	8. Characteristics of Choice Set	12. Characteristics of College	15. Original Choice of Major	20. Occupational Status
	2. Ability/ Achievement	5. Application/ Acceptance	9. Costs of Choice Set	13. College Experience	16. Occupational Aspirations	21. Educational Attainment
	3. High School Experience	6. Financial Aid Offered	10. Aid Offered by Choice Set	14. Financial Aid o Type o Amount o History	17. Potential Earnings of Other Majors	22. Years of Full-Time Employment
		7. Attendance	11. Choice: Public/ Private		18. Cumulative	23. Earnings
					20. Final Choice of Major	

Source: Adapted from St. John and Noell (1987)

1. This conceptual framework was originally developed at the start of a series of studies by the author on the impact of student financial aid. This paper summarizes the findings of the author's research along with other recent research on the impact of student aid.

2. The reasons for including these variables, at a minimum, in the analysis of factors that influence student aid are discussed in St. John and Noell (1989) and St. John (in press).

3. For a discussion of student choice models, see Jackson (1977), Jackson and Terkla (1985), and Tierney (1982a & b).

4. Tinto (1972, 1982), whose persistence model is widely used in institutional studies of persistence, uses the terms: academic integration as an indicator of a student's involvement in the academic experience, and social integration as an indicator of a students integration into the social experience in college.

5. For a discussion of the reasons for including these factors, at a minimum, in analyses of the factors that influence persistence, see St. John, Kirshstein, and Noell (1987; 1991).

6. For a discussion of the reasons for including these factors, see St. John, Celebuski, Curtis, and Noell, 1987.

7. For a discussion of the reason for including these factors, see St. John and Masten, 1988.

8. The term attendance as used here refers to the initial decision to attend college. Participation refers to the percentage of a population who attend. Enrollment refers to the number who attend. Access, in contrast, is a broader measure that refers to the percentage of a population who are currently or were previously enrolled.

9. The lack of significance of loan subsidies in Schwartz's study may be attributable to the fact that he examined the influence of aid on attendance at public universities. It is possible that loans facilitate choice of more expensive schools, which would help explain why the amount of loans was significant in St. John (1990a).

10. It is also possible that the distribution of loans has changed. If a higher percentage of loan recipients were low-income students in the 1970s, then it is possible that differences in attitudes about loans by low income would explain the discrepancy.

11. In their extensive review of prior research, Leslie and Brinkman (1988) found no prior studies that examined price responsiveness to student aid in persistence.

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